

# (12) UK Patent Application (19) GB (11) 2 291 719 (13) A

(43) Date of A Publication 31.01.1996

(21) Application No 9412826.1

(22) Date of Filing 25.06.1994

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(51) INT CL<sup>6</sup>

**B41M 5/26**

(52) UK CL (Edition O)

**G2C CHX CH6C4**

(56) Documents Cited

**GB 1553619 A EP 0381492 A EP 0036680 A  
US 4883741 A US 4513071 A US 4032691 A**

(58) Field of Search

**UK CL (Edition N) G2C CHX  
INT CL<sup>6</sup> B41M**

(54) **Marking articles by laser**

(57) A method of marking an article comprises applying to the article a substance which is photo-chemically sensitive to laser light in a particular frequency range such that the substance undergoes a chemical change in response to the laser light thus to modify its appearance, and subjecting the article to laser light in the particular frequency range thus to mark the article. The photosensitive chemical may be a dye so that the article becomes opaque after exposure to laser of 1 watt power.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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Title: Marking method

Description of Invention

This invention relates to a method of marking an item.

It is known to mark an item, for example to provide a bar code, a date indication or other information, using a laser light source. Conventional methods involve applying to an article a backing, and subjecting the article to a beam of laser light such that selected parts of the backing are burned away by the laser light.

Conventional methods suffer from the problem that a relatively high power laser light source is required in order to generate sufficient heat to burn away the backing.

According to a first aspect of the present invention we provide a method of marking an article comprising applying to the article a substance which is photo-chemically sensitive to laser light in a particular frequency range such that the substance undergoes a chemical change in response to the laser light thus to modify its appearance, and subjecting the article to laser light in the particular frequency range thus to mark the article.

In one embodiment, a backing is applied to the article prior to the article being subjected to the laser light. The backing may then be coated with the substance which is sensitive to the laser light, or if desired, the backing may be impregnated with such substance.

In each case, it is envisaged that a laser light source of a power of around one watt can be used to mark an article. In this way, the dangers and problems associated with high power laser light sources are overcome and the marking process can be achieved more easily and economically than with conventional such processes.

Preferably the substance which is applied to the article in or over the backing, is clear and becomes opaque when subjected to the laser light, or vice versa. If desired, the substance may include a dye to achieve required visual characteristics.

In one arrangement, the article is held stationary during the marking process, and a laser light beam from the laser light source, is moved relative to the article to mark the article with the desired marking.

In another arrangement, the article is moved relative to the laser light beam such that the article is marked with a desired marking.

The marking may comprise a bar code, a date indicator, or any other desired information. The marking process may be computer controlled such that information provided to successive articles of a series of articles to be marked, can be different or the same, for each article.

The article may comprise packaging.

According to a second aspect of the invention we provide a method of packaging including marking packaging with a marking by a method according to the first aspect of the invention.

According to a third aspect of the invention we provide an apparatus for marking an article according to the first aspect of the invention, the apparatus comprising means to apply the laser light sensitive substance to the article, and a low power laser light source to a beam from which the article is subjected in use.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

## CLAIMS

1. A method of marking an article comprising applying to the article a substance which is photo-chemically sensitive to laser light in a particular frequency range such that the substance undergoes a chemical change in response to the laser light thus to modify its appearance, and subjecting the article to laser light in the particular frequency range thus to mark the article.
2. A method according to claim 1 wherein a backing is applied to the article prior to the article being subjected to the laser light.
3. A method according to claim 2 wherein the backing is coated with the substance which is sensitive to the laser light.
4. A method according to claim 2 wherein the backing is impregnated with the substance which is sensitive to the laser light.
5. A method according to any preceding claim wherein the laser light source is of a power of one watt or less.
6. A method according to any preceding claim wherein the substance which is photo-chemically sensitive is clear and becomes opaque when subjected to the laser light, or vice versa.
7. A method according to claim 6 wherein the substance includes a dye to achieve required visual characteristics.
8. A method according to any preceding claim wherein the article is held stationary during the marking process, and a laser light beam from the laser light

source, is moved relative to the article to mark the article with the desired marking.

9. A method according to any one of claims 1 to 7 wherein the article is moved relative to a laser light beam from the laser light source such that the article is marked with a desired marking.

10. A method according to any preceding claim wherein the marking comprises a bar code or a date indicator.

11. A method according to any preceding claim wherein the marking process is computer controlled such that information provided to successive articles of a series of articles to be marked, can be different or the same, for each article.

12. A method according to any preceding claim wherein the article comprises packaging.

13. A method of packaging including marking packaging with a marking by a method according to any preceding claim.

14. An apparatus for marking an article according to the method of any of claims 1 to 12 wherein the apparatus comprises means to apply the laser light sensitive substance to the article, and a low power laser light source to a beam from which the article is subjected in use.

15. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.

Patents Act 1977  
Examiner's report to the Comptroller under Section 17  
(The Search report)

Application number  
GB 9412826.1

**Relevant Technical Fields**

- (i) UK Cl (Ed.N) G2C (CHX)  
(ii) Int Cl (Ed.6) B41M

Search Examiner  
MR M K B REYNOLDS

Date of completion of Search  
20 JULY 1995

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
1-13

(ii)

**Categories of documents**

- X: Document indicating lack of novelty or of inventive step. P: Document published on or after the declared priority date but before the filing date of the present application.
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A: Document indicating technological background and/or state of the art. &: Member of the same patent family; corresponding document.

| Category                   | Identity of document and relevant passages |  | Relevant to claim(s)  |
|----------------------------|--|--|-----------------------|
| X                          | GB 1553619                                 | (PHILIPS) whole document                     | 1, 5-6 and 8 at least |
| X                          | EP 0381492 A                               | (JUJO) whole document                        | 1, 5-7 at least       |
| X                          | EP 0036680* A                              | (PHILIPS) Examples                           | 1-3 and 7 at least    |
| X                          | US 4883741                                 | (FUJI) whole document                        | 1-3 and 5 at least    |
| X                          | US 4513071                                 | (KODAK) whole document especially Examples   | 1-3 and 6-7 at least  |
| X                          | US 4032691                                 | (FUJI) whole document especially columns 3-6 | 1 and 6-7 at least    |
| * Indicates corrected data |  |  |                       |

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).